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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,687	03/22/2000	David W. Livingston	97-1834	8857

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EXAMINER	
CLARDY, S	

ART UNIT	PAPER NUMBER
1617	

DATE MAILED: 05/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/532,687	LIVINGSTON, DAVID W.	
	Examiner	Art Unit	
	S. Mark Clardy	1617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claims 12-28 are pending in this application.

Applicant's claims are drawn to methods of moss control by applying a combination of:

A	N fertilizer	(claim 7: isobutylenediurea or IBDU[1])
B	Surfactant or wetting agent	(claim 4: nonionic)
C	Metal containing salt	(claim 3: copper, zinc, or iron sulfate)
D	Acidic pH adjusting agent	(claim 10: for pH 2-6; claim 11: acetic acid).

Applicant has amended the independent claims to specify that moss is substantially completely controlled within about eight weeks (claim 12), or in three or fewer applications (claim 20). Claim 28 specifies that the N fertilizer is IBDU, which is taught in Moore, Jr. (see below).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12-28 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Happ[2], further in view of Pace et al (US 4,507,142), Young (US 4,214,888), and Moore, Jr. (US 4,297,130). The previous rejection is repeated below:

Happ teaches that moss grows in poor soils and is retarded by correcting nutrient deficiencies by fertilizer application (p. 3). Such fertilizers include metal salts (magnesium, potassium, iron sulfates), and a salt which is a known N-containing fertilizer (ammonium sulfate). Also mentioned were calcium hydroxide ("hydrated lime"), and copper sulfate, but these present problems of pH control which make them less desirable (p. 4); there was no suggestion of attempting to control pH by adding an acidic pH adjusting agent. Another metal salt, "DeMoss" (the potassium salt of fatty acids) was disclosed as a moss control agent (p. 4). While applicant's use of the term "metal salts" appears to refer specifically to transition metals (spec. p. 7: Fe, Cu, Zn), the disclosure does not rule out the more generic use of the term "metal" as encompassing K salts. Finally, the utility of fungicides (maneb or zineb) was also discussed in moss control (p. 4). In view of the teaching in Happ that fertilizer application retards moss growth, one of ordinary skill in the moss control art would be motivated to combine Happ with the secondary references (i.e., the previously cited fertilizer references).

Case studies in Happ include using surfactant ("Dawn" dishwashing detergent: case study #2), and combinations of DeMoss with surfactant (#1), and ammonium sulfate with iron sulfate and ammonium sulfate (#3). Thus, Happ discloses applicant's A, B, and C components, as well as A+C and B+C, as moss controlling agents. It would have been *prima facie*

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[1] A condensation product of isobutyraldehyde and urea with a minimum total N of 30%: iPr–$CH(NHCONH_2)_2$

[2] Happ, Keith A. "Moss Eradication In Putting Green Turf" *USGA Green Section Record*, Sept/Oct 1998. p. 1-5.

obvious to use any of these in any combination for the same moss controlling utility utility[3]. There is, however, no disclosure in Happ of using an acidic pH adjusting agent; thus A+B+C+D is neither taught, nor suggested.

Pace et al teaches aqueous (col 7, lines 40-53) foliar fertilizer compositions comprising an alpha-oximino alkanoic acid component (abstract) in combination with a second essential ingredient, i.e., one or more sources of nitrogen, particularly conventional water soluble N-fertilizer compounds such as urea, ammonia, and ammonium and nitrate compounds, and water soluble urea and formaldehyde condensation products (col 6, lines 12-35). Other optional micronutrient components include water soluble salts of zinc, iron, copper, or other metals, such as their sulfate salts (col 7, lines 54-61), and surfactants (col 8, lines 54-61), including non-ionic surfactants (col 9, lines 29-38). The utility of isobutylene diurea, and acetic acid as a pH adjusting agent, are not disclosed. Minor amounts of phosphorus may also be included in the compositions (col 11, lines 32-35: 0.5 – 35% P as P_2O_5; claim 17: "including a minor and effective amount of phosphorus").

Young teaches foliar fertilizer compositions characterized by low phytotoxicity, low corrosivity, and improved toxicity stability comprising urea nitrogen and a pH buffer which maintains the pH between 6 and 7.6 (abstract, col 3, lines 59+). The pH may be "reduced below 6, i.e., to the level of 5 or below when corrosion resistant systems are available" (col 4, lines 2-5); thus, contrary to applicant's assertion, a pH of 6 is not the lower limit. Suggested buffering systems include those with acetic acid (columns 5-6; col 5, lines 40-45; col 6, lines 34-37). The compositions may further contain micronutrients such as sulfate salts of copper, zinc, and iron (col 7, lines 20-30), and surfactants (col 4, lines 28-31). One of ordinary skill in the art would be motivated to combine the pH buffering systems of the foliar fertilizers of Young with the foliar fertilizer compositions of Pace et al in order to gain the low corrosiveness of Young. Young states that "phosphorus compounds should be avoided except when used in the minor amounts and particular compositions defined herein" because of complications in balancing appropriate pH buffering with intrinsic ammoniacal nitrogen toxicity (col 3, lines 21-31). However, this teaching is not in opposition to that of Pace et al because, while Pace et al allow for the presence of phosphorus compounds in the foliar applied nitrogen fertilizers therein, the amounts are described as being "minor" – the same term used in Young et al pertaining to the limited useable amounts of phosphorus.

Moore, Jr. teaches that it is advantageous to include both an immediate release (water soluble) N-fertilizer and a slow-release (water insoluble) N-fertilizer, in sprayable foliar fertilizer compositions. The insoluble component slowly breaks down into soluble N-fertilizer compounds which may then be assimilated by the plant (columns 1-2). Representative water insoluble N-fertilizer compounds include isobutyl diurea and other urea condensates (col 2, lines 51 – 55). The discussion of pH in Example 1 (column 3) pertains to controlling reaction parameters in the process of making the isobutylene diurea; like Pace et al, above, Moore is silent with respect to the pH of the disclosed foliar fertilizer composition. One of ordinary skill in the art would be motivated to combine the slow release isobutyl diurea component of Moore, Jr. with the foliar fertilizer compositions of Pace et al in order to gain the benefit of having N-fertilizer components released over a longer period of time.

Thus, it would have been *prima facie* obvious to the ordinary artisan to have combined applicants' N-fertilizer, surfactant, metal salt, and acidic components in a single composition because Happ teaches the utility of fertilizer compositions for the control of moss, and because the secondary references teach that such components are well known in the foliar fertilization art. Further, Young teaches the utility of acetic acid containing buffer systems for improving the corrosivity characteristics of foliar applied fertilizer solutions that may overlap applicant's pH range, while Moore, Jr. teaches the additional benefit of providing a slow release N-fertilizer component such as isobutyl diurea in an aqueous foliar fertlizer composition. Phosphorus compounds are disclosed as a secondary or optional component in Pace et al and Young, which should be present in "minor amounts", as noted above; the discussions of phosphorus compounds in these two references do not render their disclosures mutually exclusive.

Finally, each of the cited secondary references pertains to components which are useful for formulating foliar applied fertilizer compositions. One of ordinary skill in the art would be motivated to combined various components which are known in the art of foliar applied fertilizer compositions in order to gain the benefits of each of the compositions as taught in the prior art. Given the teachings of Happ, one of ordinary skill in the moss control art would be motivated to use such fertilizer compositions for moss control.

Turning to evidence of unexpected results, it is noted that the data presented in the specification (p. 10-11) discloses the following combinations and results:

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[3] It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose in order to form a third composition that is to be used for the very same purpose; the idea of combining them flows logically from their having been individually taught in the prior art. In re Kerkhoven, 205 USPQ 1069

Trial	Components				Moss Reduction %	
1				D	74.3%	
2			C		86.1	
3			C +	D	77.3	
4	A +			D	34.2	
5	A +	B +		D	49.1	
6	A +		C		91.9	(See also Happ)
7	A +	B +	C		91.2	
8	**A +**	**B +**	**C +**	**D**	**98.5**	**(claimed invention)**
9	control (untreated)				25.3	

The data demonstrates that combinations of A+C and A+B+C (#6 and #7), which would have been obvious from Happ and the secondary references, are better than the other combinations or single components (#1-#5). The inventive combination (#8, A+B+C+D), however, is clearly superior to even these, the only additional component being D, the acidic pH adjusting agent. However, it cannot be determined from the data whether the improvement is unexpected since D alone was effective for 74.3% moss control, in comparison with 25.3% for the untreated moss. The 7.3% improvement from 91.2% control (A+B+C) to 98.5% control (A+B+C+D) may be merely additive and expected, or even less than expected.

In order to overcome the prima facie case of obviousness, the invention must be compared with the closest prior art to establish the criticality of the claimed time period (less than eight weeks) and number of applications (three or fewer). Absent evidence that these limitations are critical, applicant is seen as having done nothing more that what would have been obvious from the prior art.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mark Clardy whose telephone number is 571-272-0611. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sreenivasan Padmanabhan can be reached on 571-272-0629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Mark Clardy
Primary Examiner
Art Unit 1617

May 9, 2006